

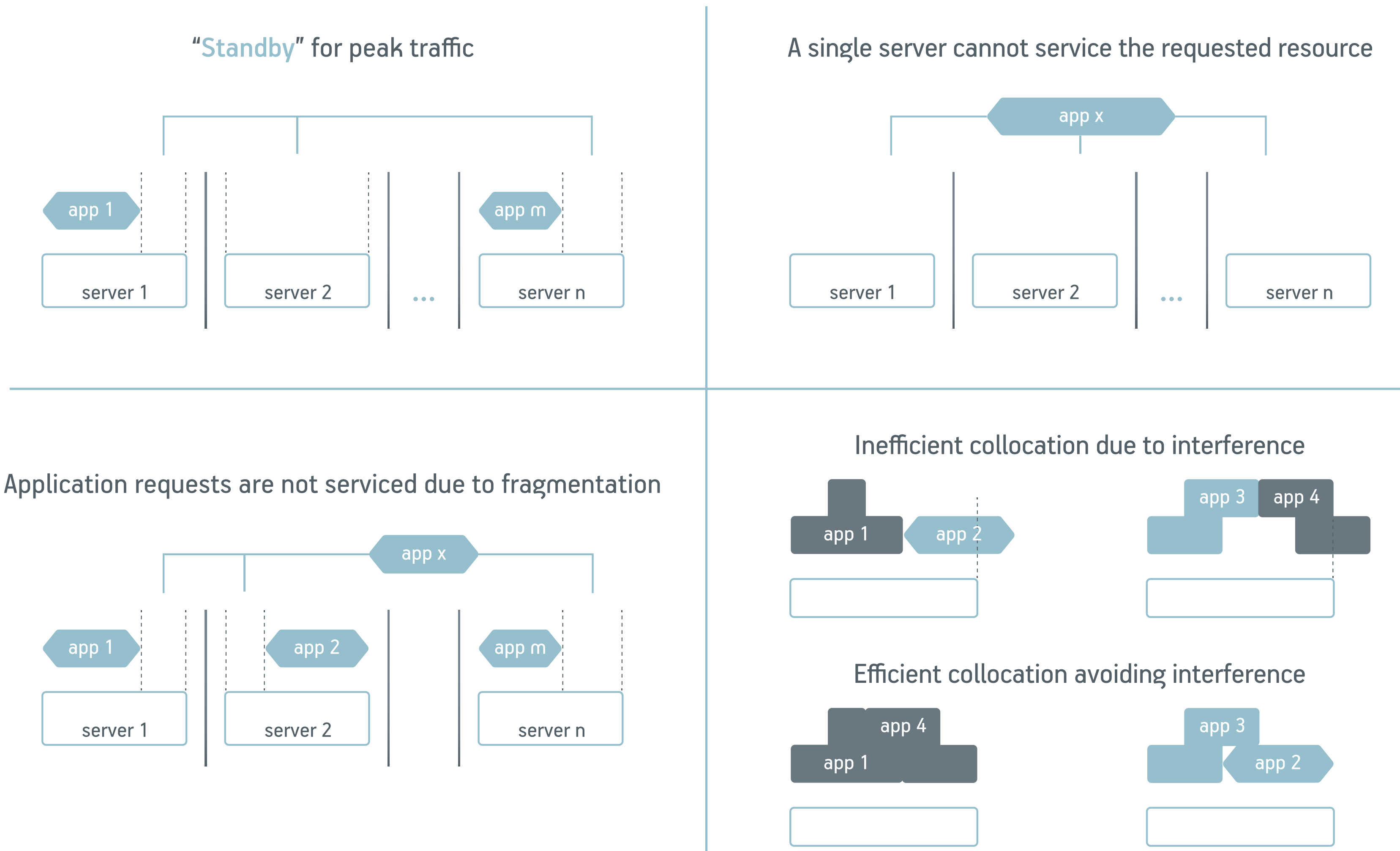
ACTiCLOUD: ACTivating Resource Efficiency and Large Databases in the CLOUD



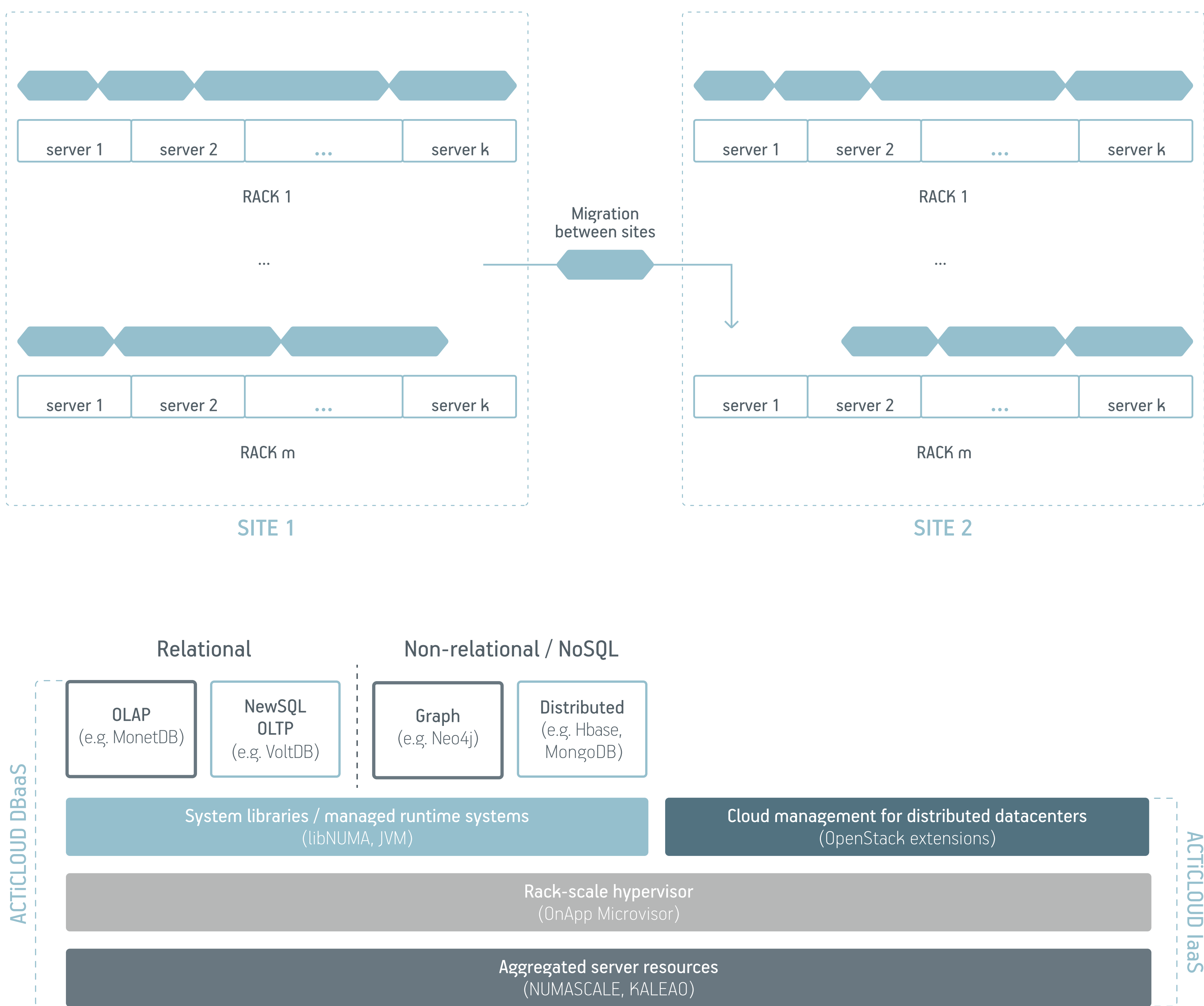
ACTiCLOUD in a nutshell

- ACTiCLOUD is motivated by the severe resource inefficiency in the cloud
- Targets at least 1.5 improvement in resource utilization by:
 - ▶ pooling resources at the rack scale
 - ▶ enforcing effective application collocations
 - ▶ enabling resource management across geographically distributed cloud sites
- Works across the entire stack from the hypervisor up to the database engine to deliver cloud resources to large, in-memory databases

The problem: Resource inefficiency in the cloud



The ACTiCLOUD approach



- Build upon European technology provided by NUMASCALE and KALEAO for hardware-assisted resource disaggregation.
- Extend OnApp's Microvisor to pool resources at the rack scale
- Enable resource efficiency at three levels:
 - ▶ Rack level (extending the Microvisor)
 - ▶ Cloud-site level (extending OpenStack)
 - ▶ Cross-site (enabling distributed resource management)
- Optimize system libraries and JVM to expose rack-scale resources efficiently
- Adapt two world-leading, in-memory databases (MonetDB and Neo4j)



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